Association between antimicrobial prescriptions, production and biosecurity in sows using Additive Bayesian Networks

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1-Motivation

With the threat of antimicrobial (AM) resistance, there is a need to cut down AM usage. However, farmers need reasonable alternatives

2-Objectives

To assess possible associations between biosecurity, AM use and productivity to identify best practices for low AM use and high productivity

3-Materials and Methods

Data came from 157 Danish sows herds. To better understand interdependencies between investigated factors, Additive Bayesian Network (ABN) modelling was used: a technique that produces a directed acyclic graph, allowing easy analysis of the network of interdependencies

4-Discussion and Conclusion

Contrary to results by Postma *et al.* 2016, our model showed no association between AM consumption and productivity, nor with biosecurity. This is probably due to a very low AM consumption in Danish sow herds and high biosecurity, because of a fine tuned system and strict regulations in place

Results :

LEGEND:

Variable name
Median (95% confidence interval)

= Association

Herd size variable

Production variable

SPF biosecurity system

Biocheck score

Piglets per litter
15.7 (14.6 – 16.9)

Mortality until weaning
13.2% (8.8 – 17.1%)

Weaned pigs/litter
13.6 (12.5 – 14.7)

Farrowing percentage
88% (78.3 – 92%)

Mortality in sows
9.5% (1 – 16%)

Non-successful insemin.
5% (2 – 12%)

Litters/sow/year
2.28 (2.13 – 2.38)

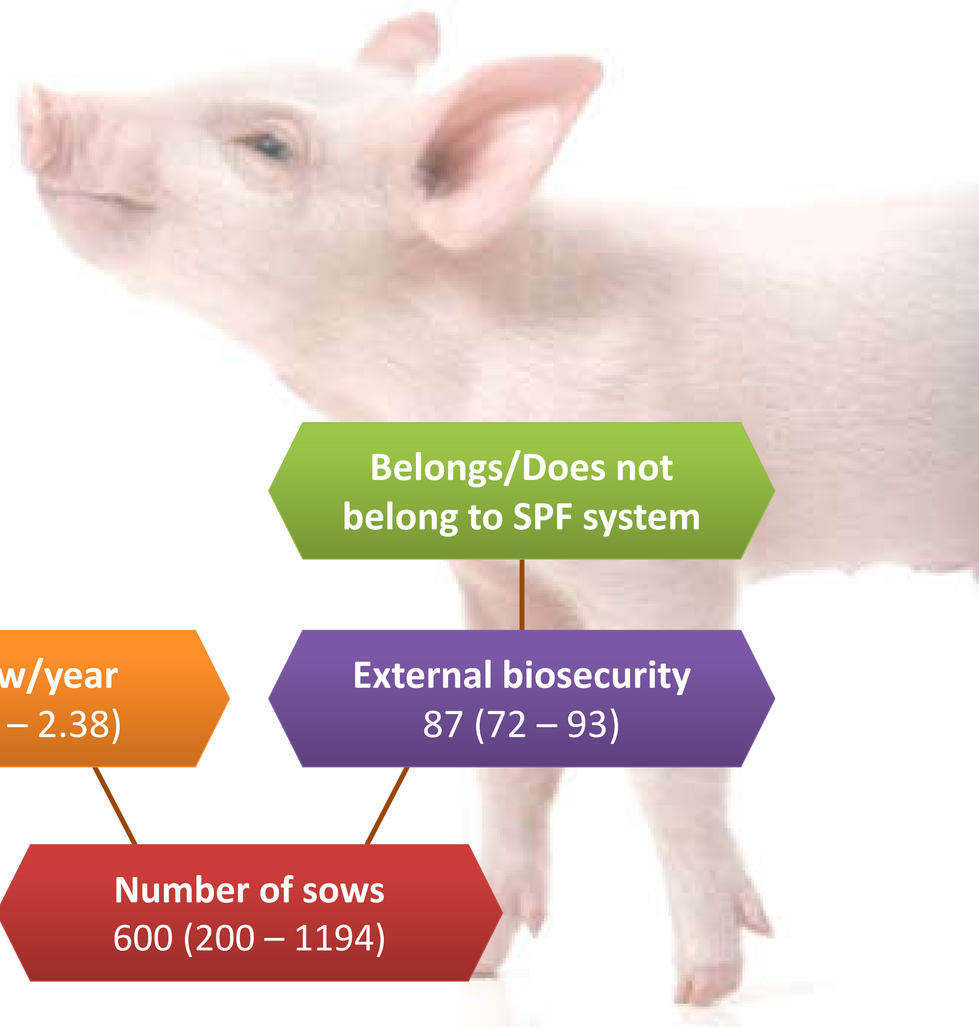
Belongs/Does not belong to SPF system

External biosecurity
87 (72 – 93)

Number of sows
600 (200 – 1194)

Variables with no association:

- AM prescription for sows
- AM prescription for weaners
- Internal Biosecurity score
- Stillborn piglets per litter
- Feed use for sows
- SPF class Red/Blue



The results were confirmed by a Random Forest Analysis and a Discriminant Analysis

Reference: Postma *et al.* Porc. Health Man. (2016) 2:9

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